CADPIPE ISO
Tutorial

CADPIPE
SOFTWARE

AutoCAD
2009
Compatible
Autodesk

CADPIPE ISO TUTORIAL

This tutorial is a brief introduction to the power of CADPIPE ISO. We will show you a few key features and the general drawing procedure.

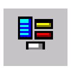
Since this is not an AutoCAD tutorial, you should have a basic working knowledge of AutoCAD before you proceed.

Command access

There are several different methods for selecting commands in CADPIPE ISO. You can choose all commands through pull-down menus, use toolbar buttons, the Quick menu, or enter the commands on the command line .

Toolbars

CADPIPE ISO offers toolbars, with buttons for specific commands. Next to each pull-down menu command, the corresponding toolbar button will be shown:



Pick “Current Settings” from the “Settings” menu.

Quick Menu

CADPIPE ISO includes a pop-up menu referred to as the Quick Menu. This menu was developed as a quick way to access useful commands in order to speed up the drawing process. It is a combination of AutoCAD SNAP commands, VIEW commands, and the CADPIPE Turn Up and Turn Down commands.

To use the Quick Menu pop-up, simply click the appropriate mouse button anywhere on the drawing. If you are using a two-button mouse, hold the <Shift> key down and click the right button on the mouse. For a three-button mouse, you can configure you mouse to use the middle button.

Keyboard entry for commands

For a list of commands that you can enter through the keyboard at the command prompt, type **?? <Return**>.

Responding to prompts

All text that appears on the computer screen is set apart from the explanatory body copy: `we use a different type style`.

The appropriate response to a prompt is in bold. The metric equivalent to an imperial entry is in brackets and follows the bold response:

`Prompt:` **`RESPONSE <Return>`** `(1050)`

Picking points on the drawing

When you are required to pick a point on the drawing, we indicate the point in the text by **<P1>, <P2**>,etc.,and then show the corresponding "P" point in an illustration. For example:

```
Digitize clockwise end of head::<P1>
Digitize counterclockwise end of head::<P2>
```

For accuracy, place fittings with the aid of OSNAP OVERRIDES. To call up the OSNAPS menu, press the <Shift> key while depressing the right-hand mouse button.

Attribute blocks

To make accurate picks on the drawing, you must sometimes pick CADPIPE **attribute blocks**. These blocks store information about the valve, fitting, or pipe (such as size, line number, item type, length, etc.).

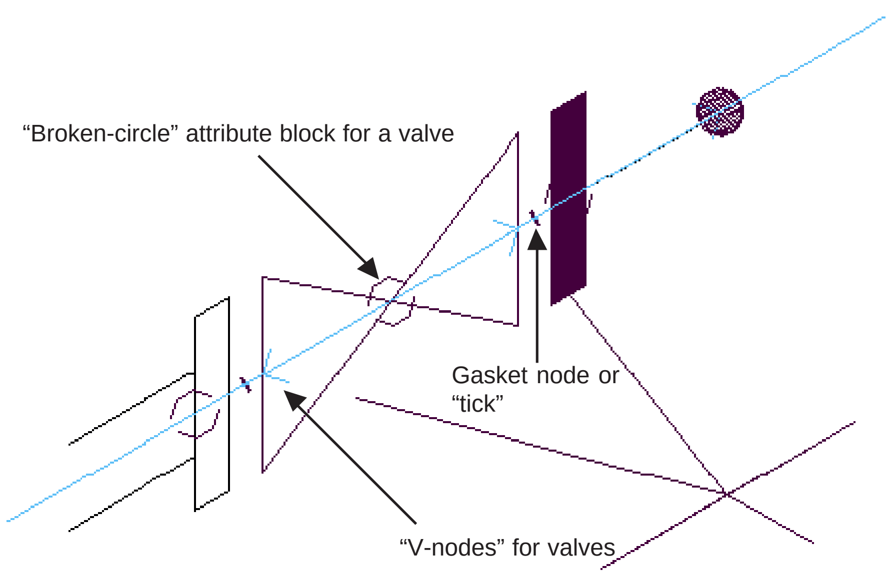
CADPIPE uses three types of attribute blocks:

V-node: stores dimension and engagement information. It is in the shape of a "V" and is frequently found beneath weld dots.

Broken-circle: stores information on valves, pipes, and fittings that is used by the bill of materials program as well as routines like Query.

Gasket "tick": stores information on the gasket and bolt.

We will refer to v-nodes, broken-circle nodes and gasket ticks in the tutorial.



Angle of rotation

For angle of rotation, your system must be set to the AutoCAD defaults:

```
East 3 o'clock = 0°
North 12 o'clock = 90°
West 9 o'clock = 180°
South 6 o'clock = 270°
```

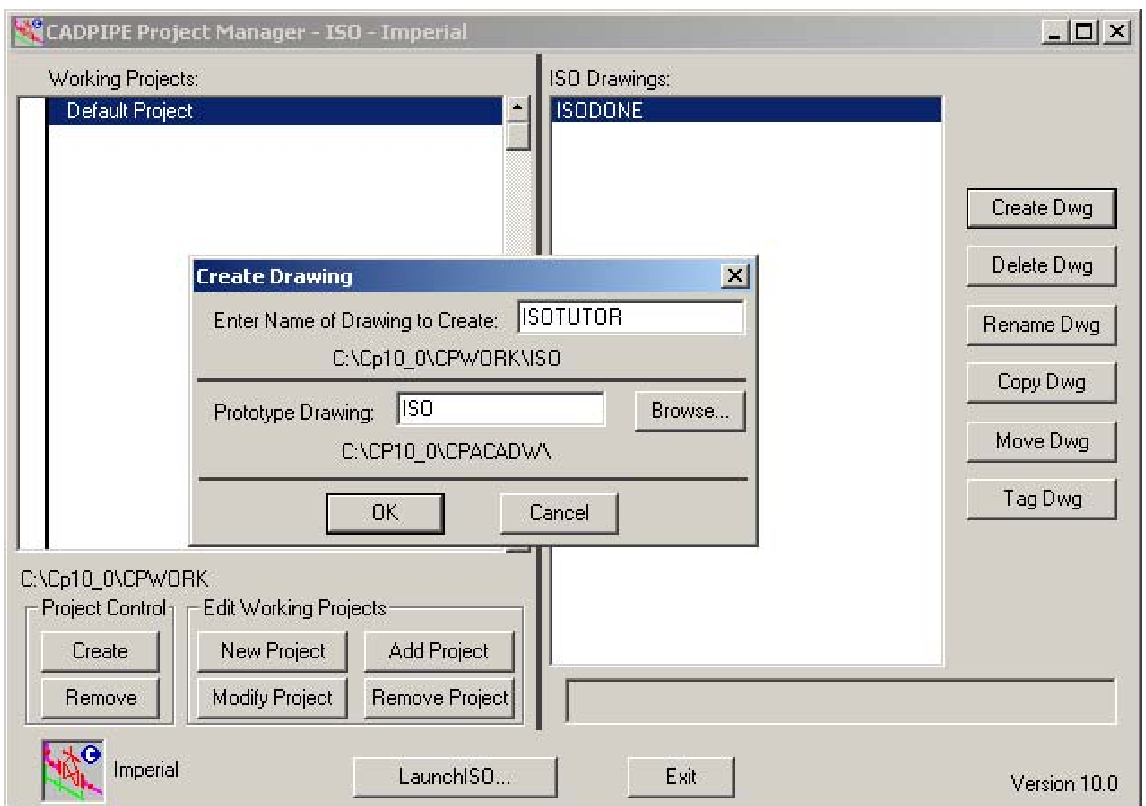
Correcting errors

If at any time during your drawing session you are using a CADPIPE command and make a mistake, use the CADPIPE [Undoback] command to undo the drawing back to the beginning of that CADPIPE command. Pick [Undoback] from the "EDIT" menu or type UB <Return> at the command prompt.

Getting Started

Create a new drawing

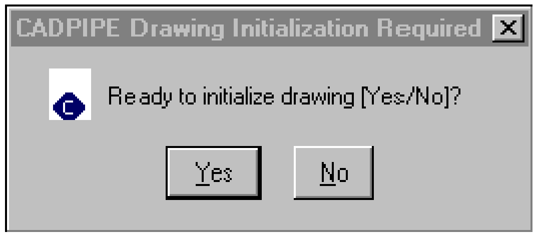
• From the Windows Taskbar, select "Start"--"Programs"--"CADPIPE"--"ISO".
• In Project Manager, click "Create Dwg".
• Type **ISOTUTOR** as the drawing name. Click "Ok".
• Highlight the new drawing in the "ISO Drawings" window and click "Launch ISO"



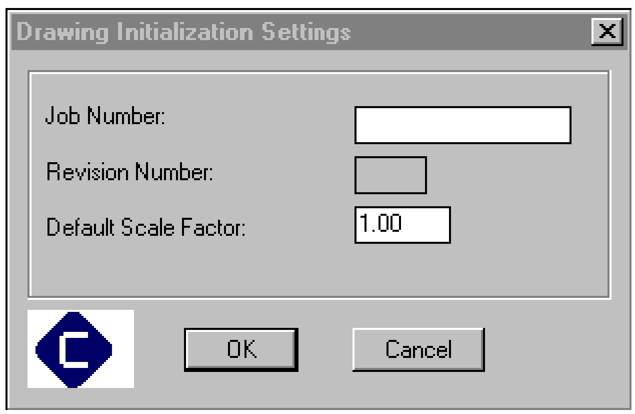
Initialize the drawing

After the program loads, you must "initialize" the drawing: This process establishes some settings for the "prototype" or "base" drawing.

Click "Yes" on the Drawing Initialization Required dialog box.

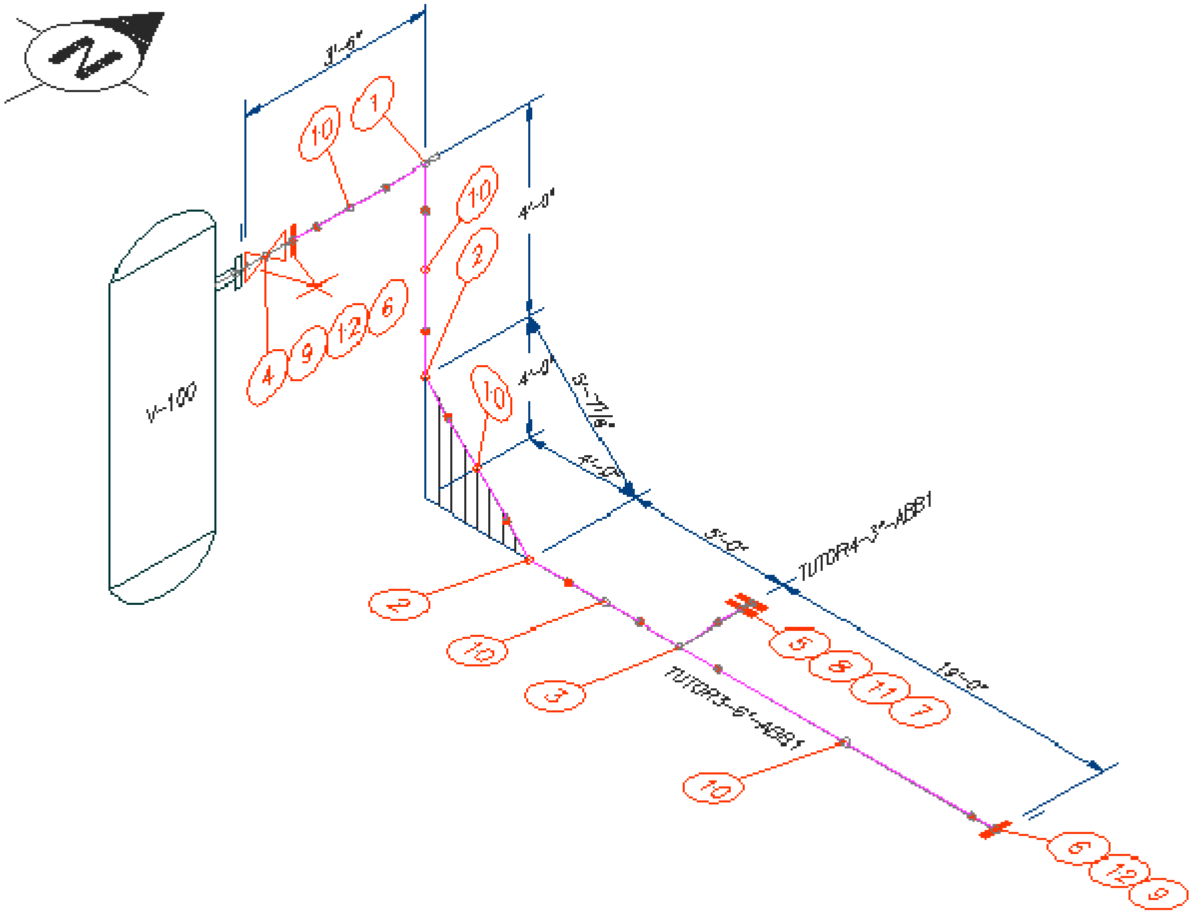


The Drawing Initialization Settings dialog box will appear. This allows you to set your Job Number, Revision Number, and Default Scale Factor. Click "Ok."



Next, click "Ok" in the Cadpipe Version dialog box. If you do not see this dialog box, reload the program.

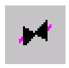
Following is the CADPIPE drawing you will create in this Tutorial session. Refer to this drawing throught the Tutorial. The drawing file is stored in the `\ISO` directory off the main CADPIPE directory and is called `ISODONE.DWG` (`MISODONE.DWG` in metric CADPIPE).


3'-6"
4'-0"
4'-0"
5'-7 1/8"
4'-0"
5'-0"
19'-0"
V-100
TUTOR4-3"-ABB1
TUTOR3-6"-ABB1
1
2
3
4
5
6
7
8
9
10
11
12

Place Equipment, Pipe, Fittings, Valves

Place the Vessel

Change the isometric plane to right-hand



Pick the right-hand isoplane icon from the “SETTINGS” — “Isoplane” menu or toolbar.

Pick [2:1 Head] from the “PLACE” — “Equip” menu:

Command: <<Place 2:1 elliptical head>>
Digitize clockwise end of head::**<P1>**(Pick P1 as shown in Figure 1.)

Digitize counterclockwise end of head::**<P2> (or @1<210)**
(Pick P2 as shown in Figure 1.)

Enter direction of head:**90<Return>**
(Type 90 to indicate that the vessel is placed vertically.)

Digitize corner of matching face <Exit>:**<P3> (or @2-1/2<270)**
(Pick P3 as shown in Figure 1.)

Digitize base point for item <Leave>::**<Return>**
(Press <Return> to leave it where it is.)

Digitize tag location <None>::**<P4>** (Pick P4 as shown in Figure 1.)

First line <None>: **V-100<Return>** (Enter V-100 for the vessel tag.)
Second line <None>:**<Return>**
(We are only placing one line of text, so press <Return> to exit the command.)

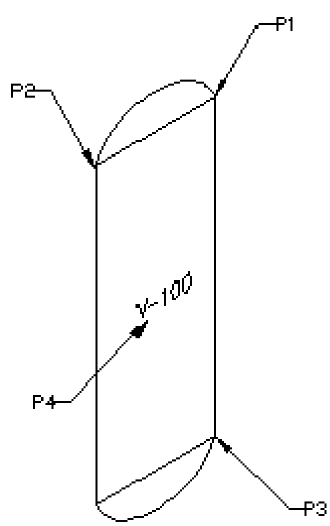
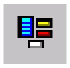


Figure 1

Define design specifications

Before drawing a routing line or placing fittings or valves, you must set the line designation and pipe size. The line designation consists of a line number and the material specification.

Set the line designation



• Pick "Current Settings" from the "SETTINGS" menu.
• The "Current Settings" dialog box will appear.
• Type **TUTOR3** in the "Line Number" field.
• Click **ABB1** in the "Spec List." ABB1 will appear in the "Material Spec" field.

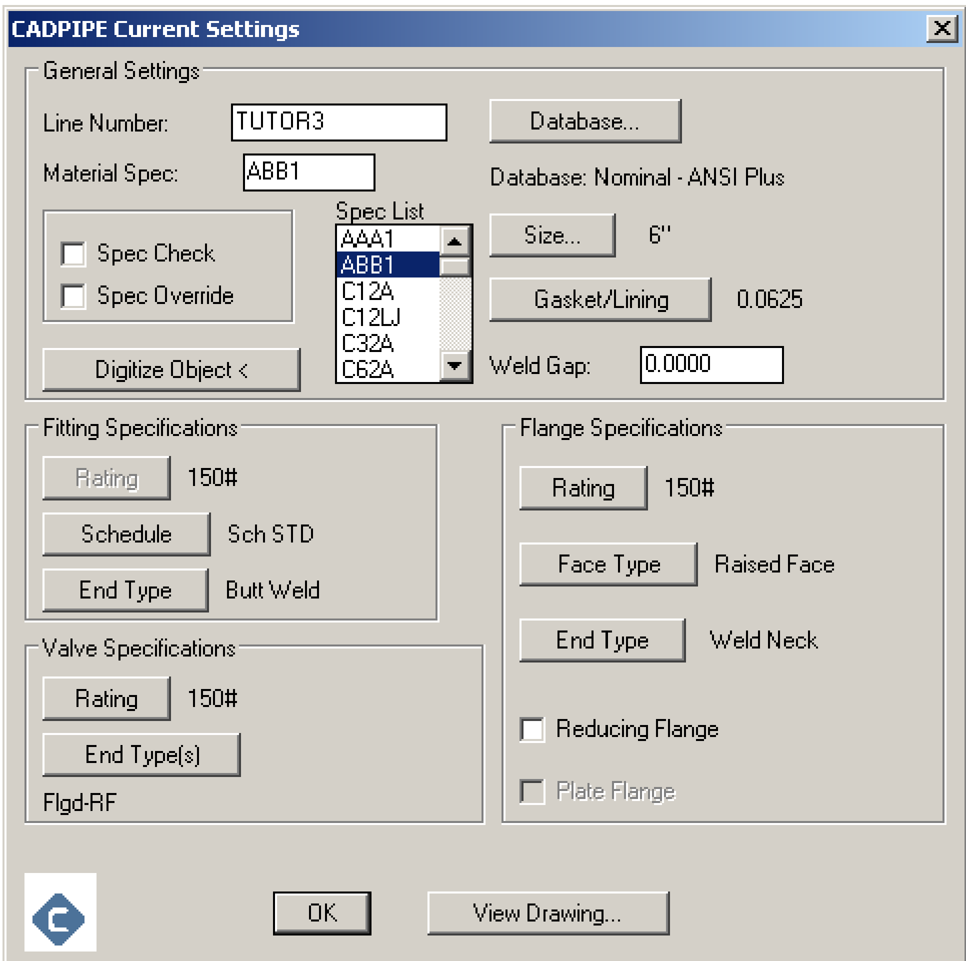


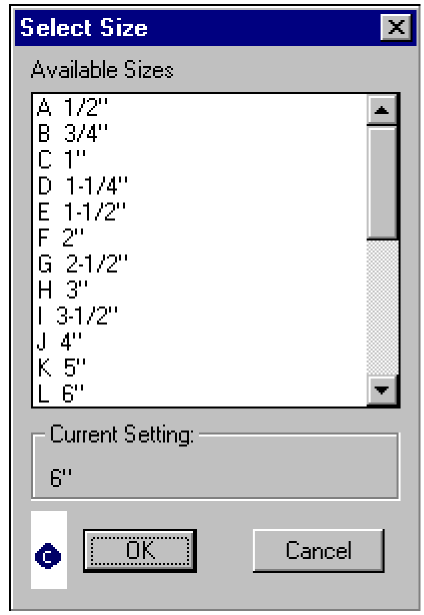
ABB1 is one of the many specifications that are supplied with CADPIPE. These specifications contain predefined settings for valves, fittings, and pipe. A specification will set defaults such as rating, end type, and schedule automatically when the Spec Check command is on.

Set the pipe size

Next, set the pipe size.

In the “Current Settings” dialog box, click “Size.”

If the size is not already set to 6" (150mm) in the “Select Size” dialog box, click **6"** (150mm) and then “Ok.”

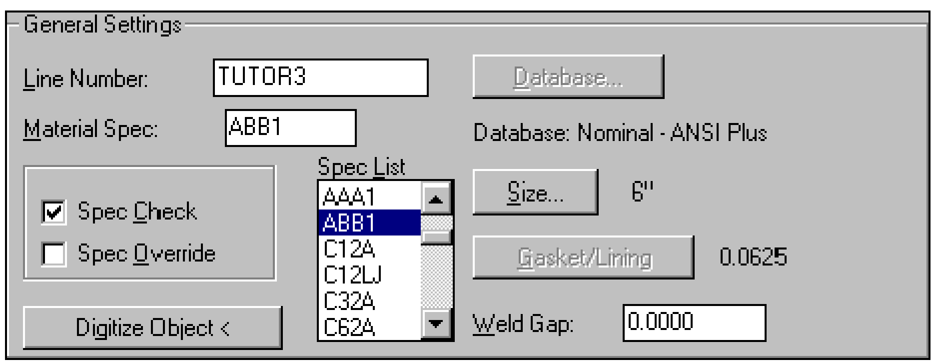


Turn Spec Check on

In CADPIPE, the designer can either access everything in the database, or apply a standard specification to restrict the items that can be placed, or use a combination of both.

We will place items on the Tutorial drawing with the **Spec Check** command on. This means that many of the defaults (end type, schedule, rating, etc.) will be set automatically by the program according to what is defined in the material specification file for specification ABB1.

In the “Current Settings” dialog box, click the box beside “Spec Check.” An “x” in the box indicates that Spec Check is active:

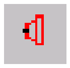


Settings which are controlled by the specification will be grayed out.

Click “Ok.”

Place the nozzle on the vessel

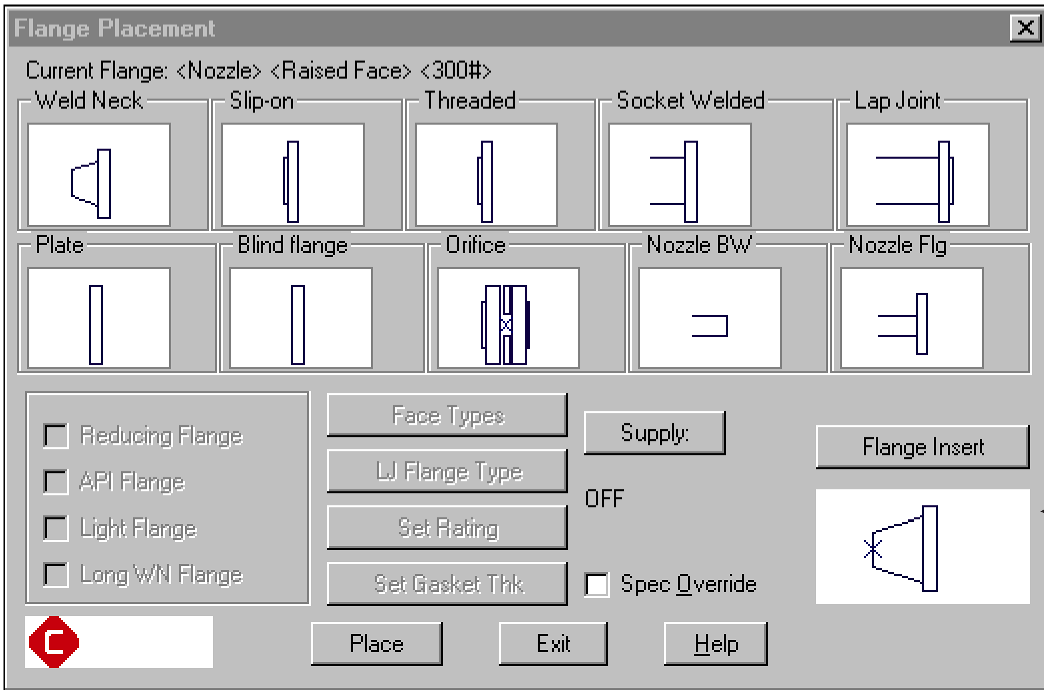
We don’t want the nozzle on the vessel reported in the bill of materials because it is part of the equipment rather than the piping. So, we will place a nozzle symbol rather than a flange (flanges are reported in theBOM).



Pick the flanged nozzle icon from the "PLACE" — "Flange" menu:

The face type, rating and gasket thickness are already set for this nozzle because Spec Check is on.

• In the **Flange Placement** dialog, select **Nozzle Flg**.
•The insertion point is the **butt of the nozzl**e. Click the "Flange Insert" button to toggle the setting from the face to the butt.
• Click "Place" *(refer to Figure* 2).



This icon shows that the nozzle will be inserted at the butt of the nozzle. The "x" represents the insertion point.

Command: <<Place nozzle>> <6"><300#><Raised Face>
<6"><300#> flange thickness (including face) 1.4400>
Enter actual thickness <1.4400>:**<Return>**

(Press **<Return>** to accept the default flange thickness, 1.4400. The thickness is used by CADPIPE to calculate the bolt lengths.)

Digitize butt of nozzle:: **<P1>**

(Pick P1 in Figure 2.)

Angle to face: **30<Return>**

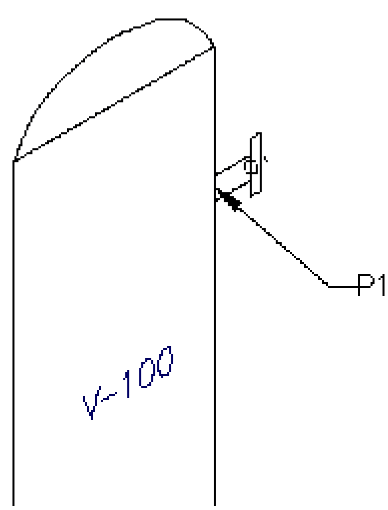


Figure 2

Draw the routing line

CADPIPE uses an intelligent 3D line (routing line) to represent a run of pipe, and items placed on the routing line automatically adopt the intelligence (size, material spec and line number) of the line. Having drawn your routing line, you can place elbows, valves, flanges, fittings and pipe. You can place horizontal, vertical and rolled routing lines.

Pick [Routing Line] from the "PLACE" menu (refer to Figure 3):

`Command: <<Pipe layout>>`
`Line designation: <TUTOR3 - ABB1>`
`Pedit/Join/Designation/<First point>:`**`<P1>`**(Pick the butt of nozzle, P1.)

`Undo/<To point>::`**`<P2>`**
`Undo/<To point>::`**`<P3>`**
(Two colons at the end of this prompt indicate that you can change isoplanes without leaving the command. Pick the left-hand icon from the "ISOPLANES" menu in the top menu bar.)

`ISOplane <LH>`
`Undo/<To point>::<Ortho off>` **`<P4>`**
(Turn ORTHO mode off before you pick P4. The <F8> key toggles ORTHO mode on and off.)
`Undo/<To point>::<Ortho on>` **`<P5>`** (Turn ORTHO mode on before you pick P5.)
`Undo/<To point>::`**`<Return>`** (Press <Return> to exit the command.)
`Command:`

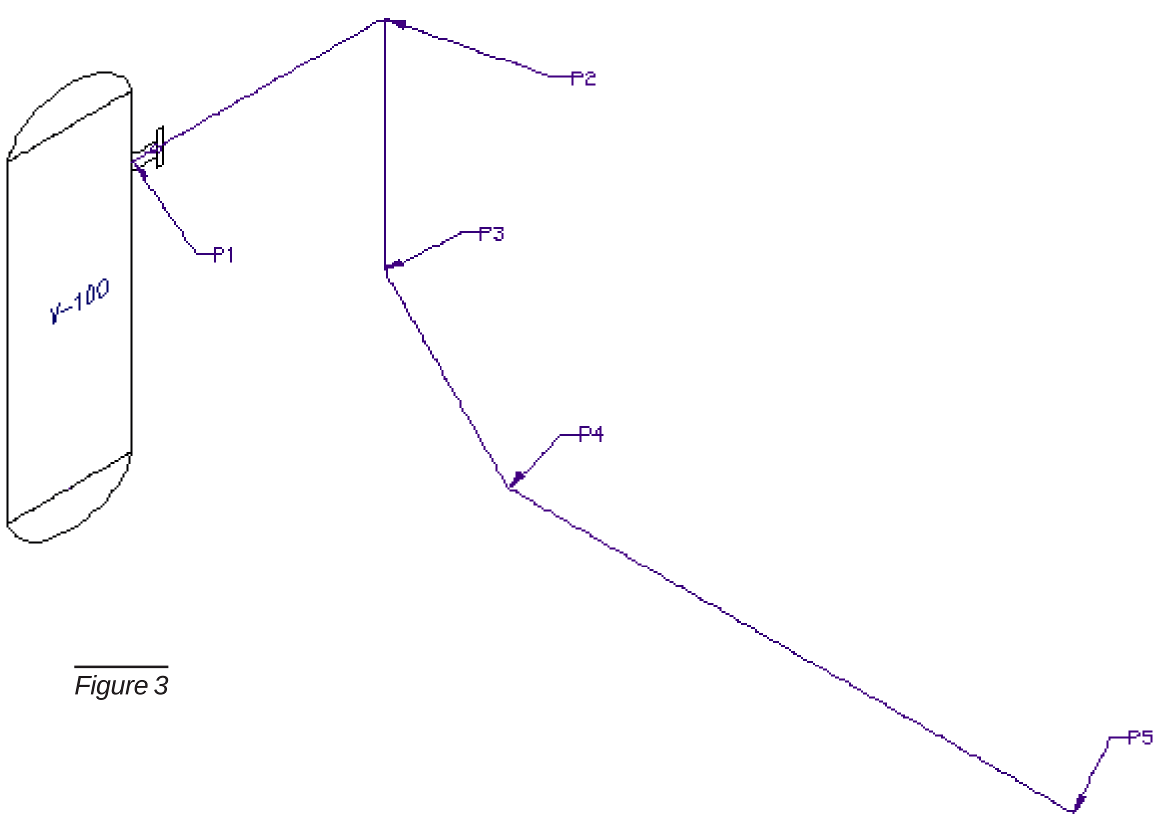


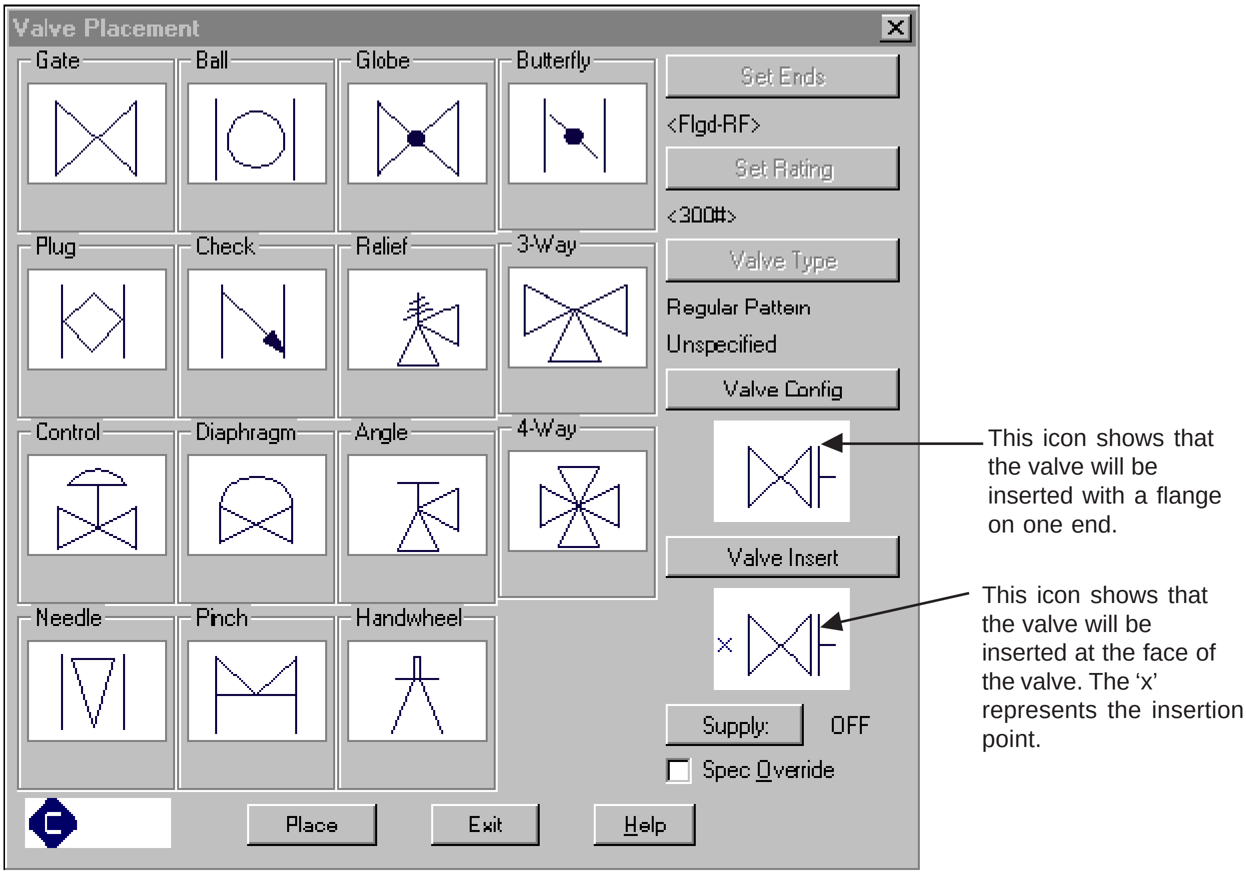
Figure 3

Place the gate valve to the face of the nozzle

For this valve and the remaining fittings, it may be easier to turn the SNAPoff. The <F9> key toggles SNAP on and off.

Pick the valve icon from the “PLACE” — “Valve” menu:

The “Valve Placement” dialog box will appear.



• Select a **Globe Valve** from the **Valve Placement** dialog.

• We will place the valve with a **flange on one end**. To change the setting, click the “Valve Config” button and choose a setting from the “Valve Configuration” dialog box.You can choose to place a valve with a flange on one end, a flange on two ends, or no flanges.

• Our insertion point is the **valve face**. Click the “Valve Insert” button and select the valve face icon from the “Valve Insert” dialog box.

• Click “Place” *(refer to Figure* 4).

```
Command: <<Place Gate valve>> <6"><300#><Flgd-RF>
Digitize inlet face of valve <Exit>:: node of <P1>
```

(Use OSNAP NODE to pickthe gasket tick on the nozzle, P1.)

```
Valve insertion point <Valve face>
Angle to handwheel <None>: 330<Return>
Digitize inlet face of valve <Exit>::<Return>
Command:
```

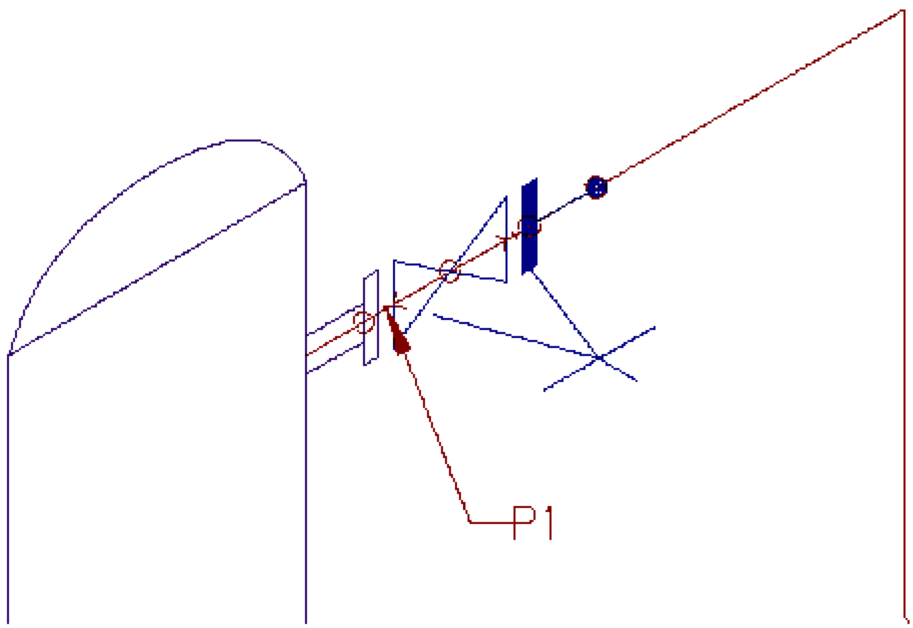
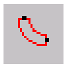


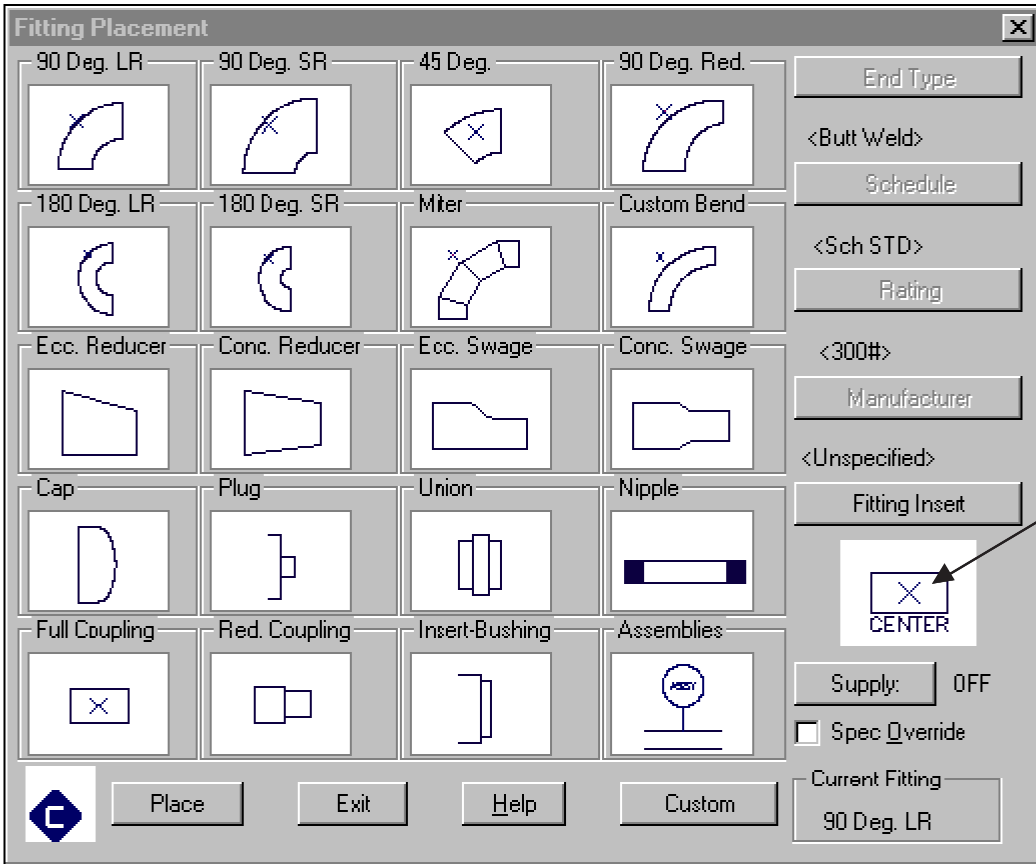
Figure 4

Place the 90 LR elbow



Pick the Elbow icon from the "PLACE" —"Fitting" menu:

The "Fitting Placement" dialog box will pop-up.



This icon shows that the elbow will be inserted at the center of the elbow.

• Pick the **90 Deg. LR** Elbow from the **Fitting Placement** box.

• Our insertion point is the **center of the fitting**. Click the "Fitting Insert" button to toggle the setting between the center and the end.

• Click "Place."

```
Command: <<Place 90 LR elbow>> <6"><Sch STD><Butt Weld>
Digitize center of fitting <Exit>:: INTERSEC of <P1>  (Refer to Figure 5)
Angle to one end: NEAREST to <P2>
Angle to other end: NEAREST to <P3>
Digitize center of fitting <Exit>:: INTERSEC of <Return>
Command:
```

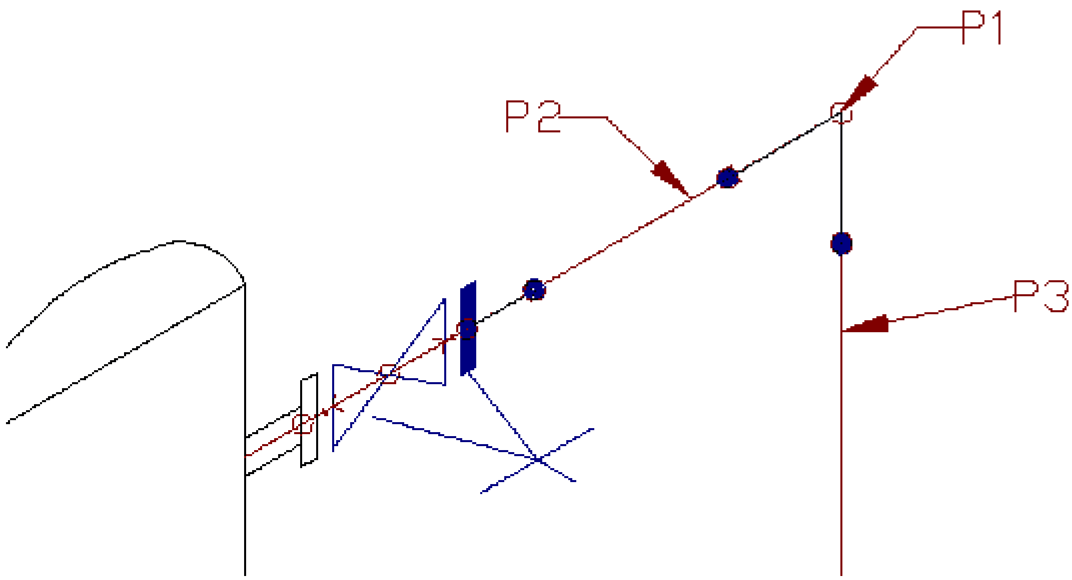
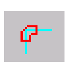


Figure 5

Place the 45 LR elbows

Auto-Elbow is another method for placing elbows in CADPIPE ISO. It automatically places the elbows along a specified routing line. We will use this method to place the 45 LR elbows.

 **Pick “Elbow SR ” from the Auto menu:**

`Digitize start point on routing line: NEAREST to` **<P1>**

(Or select any point along routing line TUTOR1-ABB1. See Figure 6.)

`Digitize end point on routing line <ALL>: NEAREST to` **<Return>**

(Press <Return> to Auto-Elbow the entire line)

`Command:`

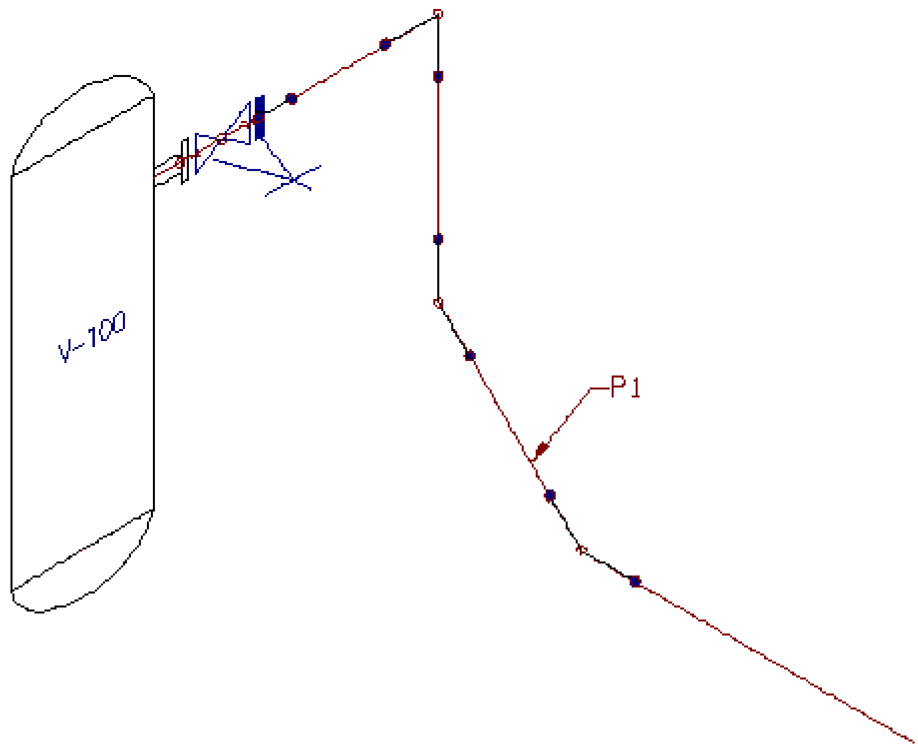
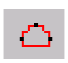
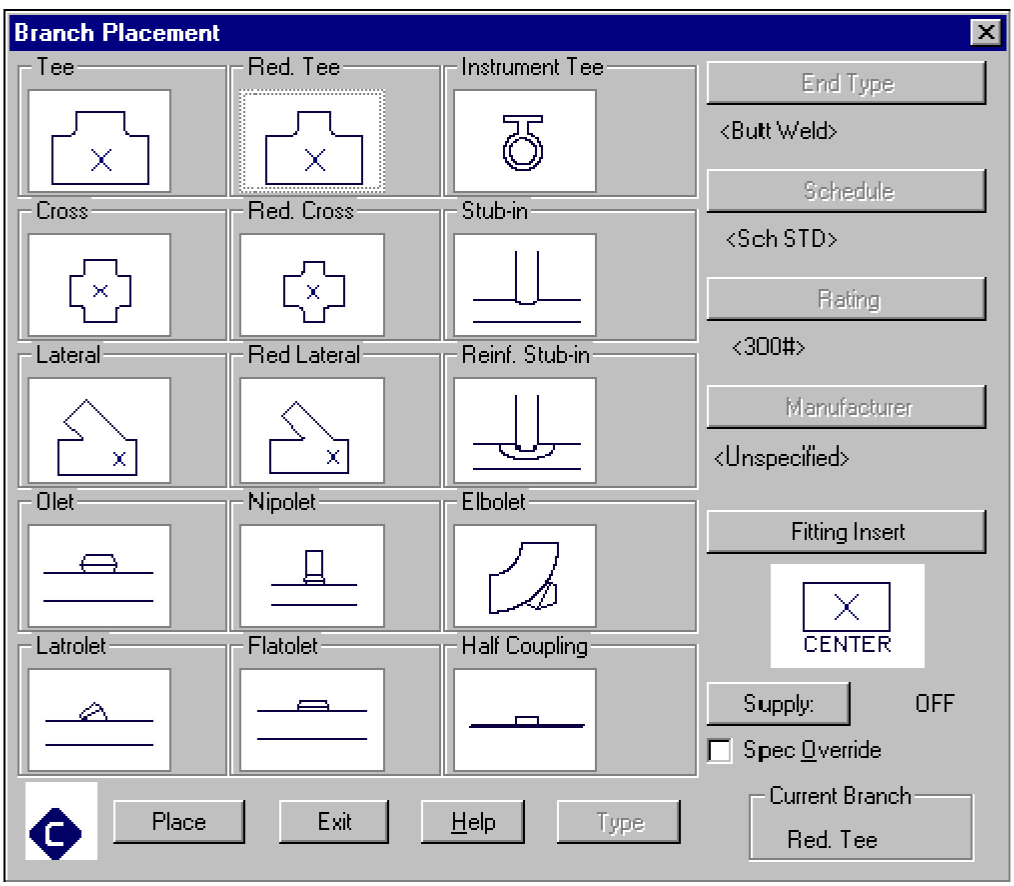


Figure 6

Place the 6"x 3" reducing tee



Pick the reducing tee icon from the “PLACE” — “Branch” menu:



• The insertion point is the **center of the fitting**. Click the "Fitting Insert" button to toggle the setting between the center and the end.

• Click "Place."

Command: <<Place reducing tee>> <6"><Sch STD><Butt Weld>
Main run size <6">

(Select an outlet size of **3"** [80mm] from the "Select Outlet Size" dialog box. Click "Ok".)

Digitize center of fitting:: NEAREST to **<P1>** (Refer to P1 in Figure 7.)
Angle to main run end: NEAREST to **<P2>**
Angle to branch: NEAREST to **30<Return>**

(The branch comes off the main run at 30 degrees.)

Enter line number of branch <TUTOR3>:**TUTOR4<Return>**

(The line number for the branch is TUTOR4.)

Enter material spec of branch <ABB1>:**<Return>**

(The material specification for the branch is the same as the main run.)

Digitize tag location <None>::**<Return>**
Command:

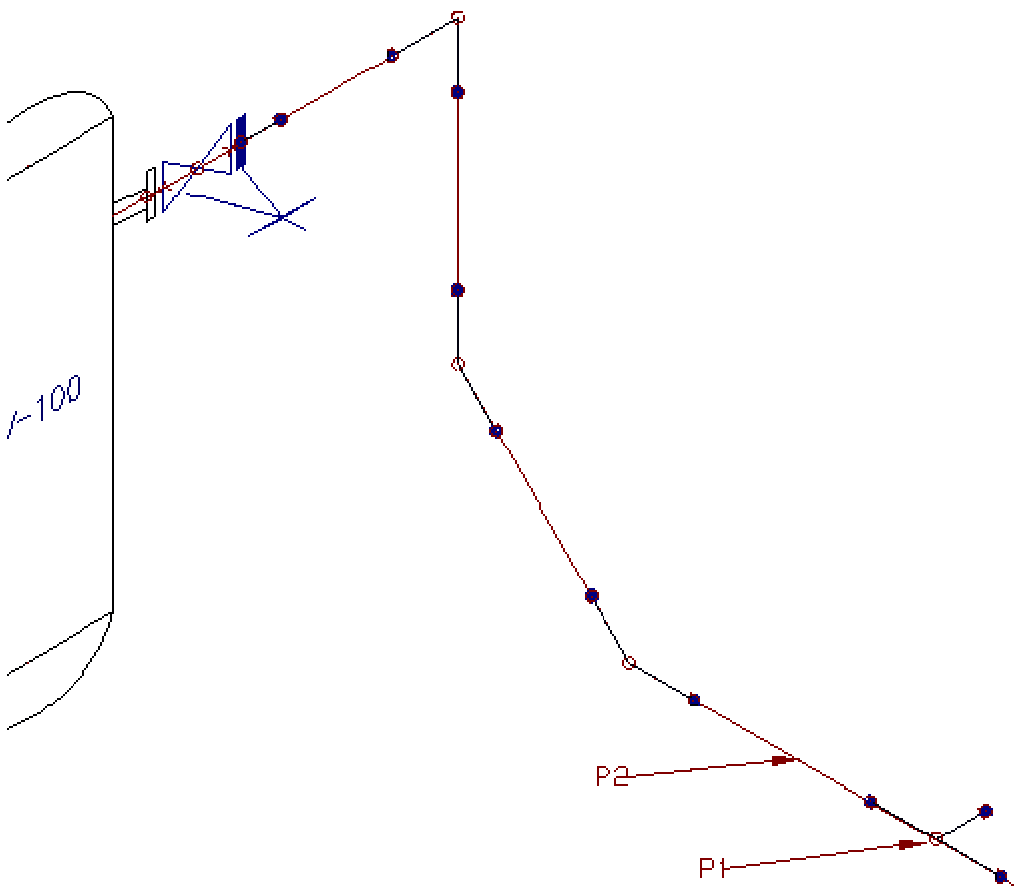


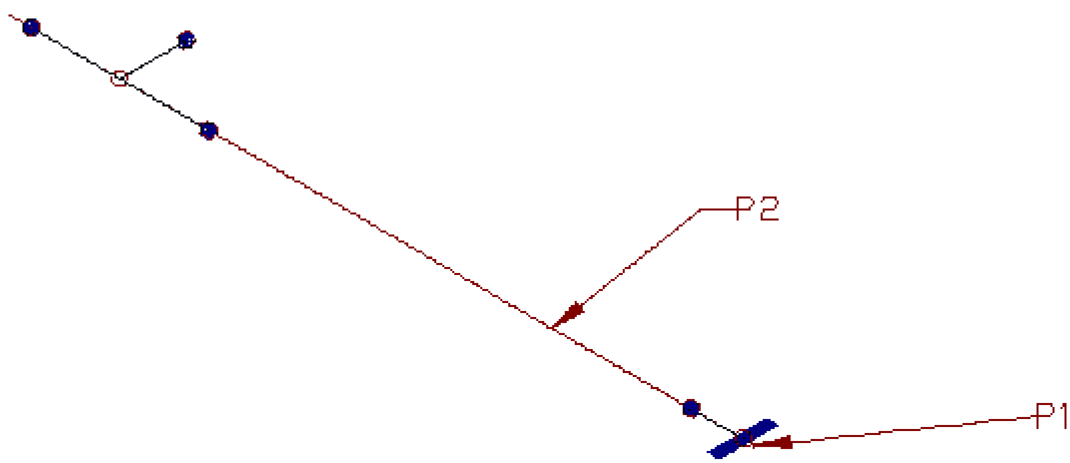
Figure 7

Place a flange at the end of the main branch

Pick the weld neck flange icon from the “PLACE” — “Flange” menu:

- The insertion point is the **face of the flange**. Click the “Flange Insert” button to toggle the setting between the face and the butt.

- Click “Place.”



Command: <<Place flange>> <6"><300#><Sch STD><Weld Neck><Raised Face>
Digitize face of flange/Insert/ <Exit>:: _endp of **<P1>**
(Use OSNAP ENDPOINT to pick the end of the main branch.)
Angle to butt:**<P2>**
Digitize face of flange/Insert/ <Exit>::**<Return>**
Command:

Place a flange on the reducing tee

Set the current line designation and pipe size to the branch.

The current line designation is TUTOR3-ABB1 and the size is 6" (150mm). We want to place a flange on the reducing tee. The branch line designation is TUTOR4-ABB1 and size is 3" (80mm). Before we place the flange, we will change our designation and size to that of the branch.

• Select [Reset] from the “SETTINGS” menu.

• Pick the node at the end of the branch (**<P1>** in *Figure* 9). The current line designation and size is now set to that of the branch.

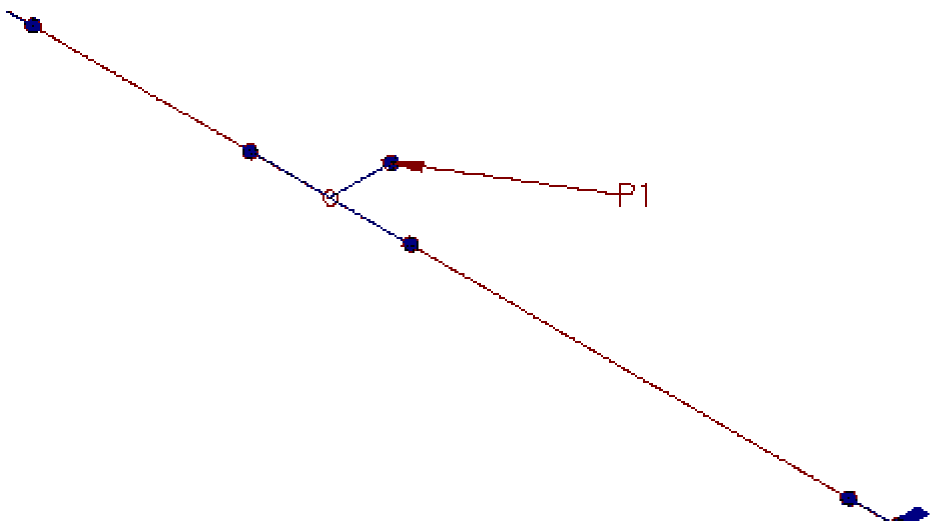
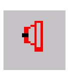


Figure 9



Pick the weld neck flange icon from the “PLACE” — “Flange” menu:

• The insertion point is the **butt of the flange**. Click the “Flange Insert” button to toggle the setting between the face and the butt.

• Click “Place” *(refer to Figure 10)*.

```
Command: <<Place flange>> <3"><300#><Sch STD><Weld Neck><Raised Face>
Digitize butt of flange/Insert/ <Exit>:: _node of <P1>
```
(Use OSNAP NODE to pick the node at the end of the branch.)
```
Digitize butt of flange/Insert/ <Exit>:: <Return>
Command:
```

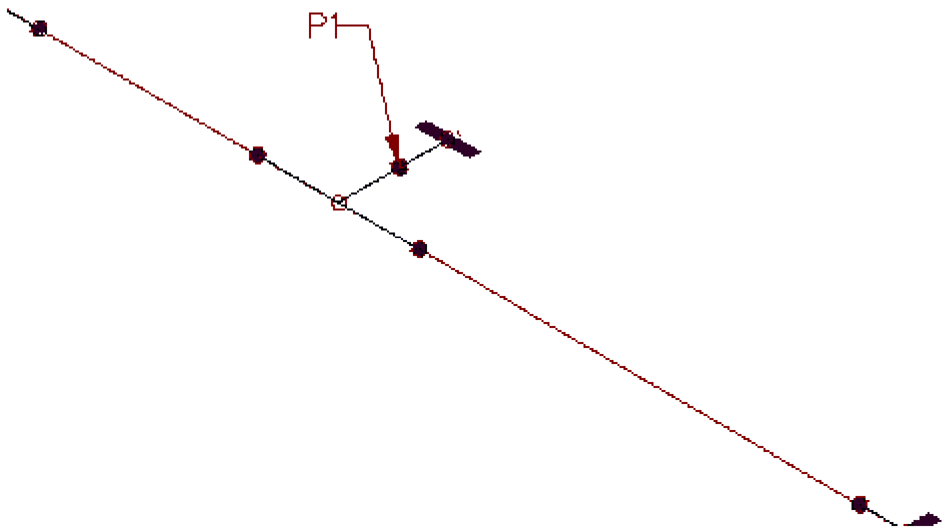
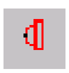


Figure 10

Place the blind flange on the branch

Next, place a blind flange on the raised face weld neck flange on the branch.



Pick the blind flange icon from the “PLACE” — “Flange” menu:

• The insertion point is the **face of the flange**. Click the “Flange Insert” button to toggle the setting between the face and the butt.

• Click “Place” *(refer to Figure 11)*.

```
Command: <<Place blind flange>><3"><300#><Raised Face>
Digitize face of flange/Insert/<Exit>:: _node of <P1>
                                         (Use OSNAP NODE to digitize P1.)
Flange insertion point <Flange face>
Flange Face <Raised Face>
Digitize face of flange/Insert/ <Exit>::<Return>
Command:
```

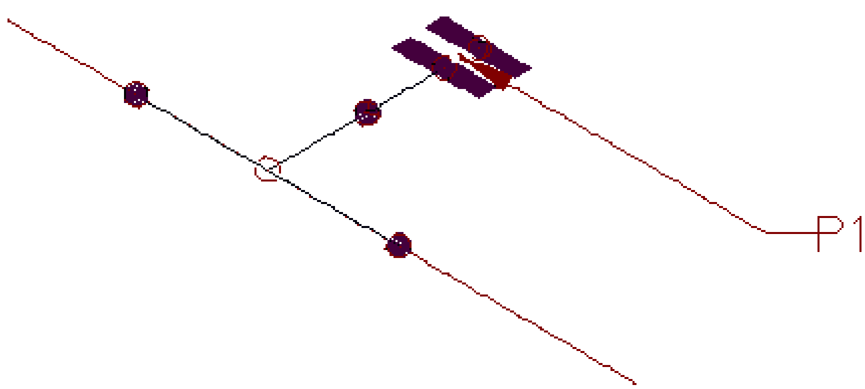


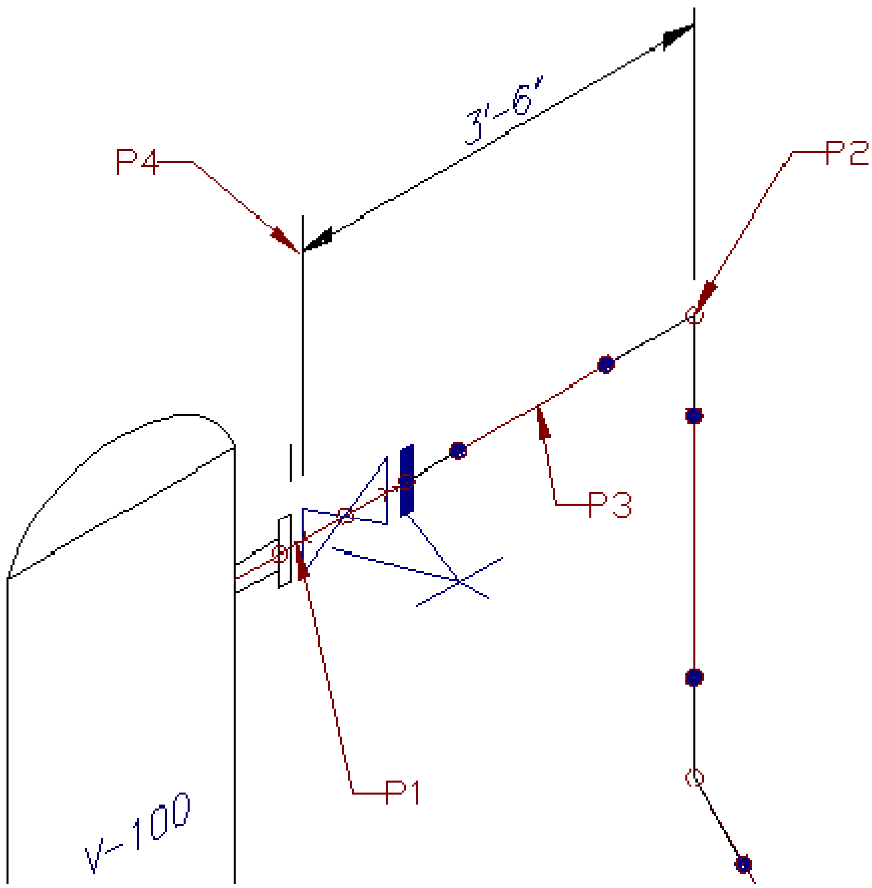
Figure 11

Dimension the Drawing

Dimension nozzle to 90 LR elbow

We will first dimension the segment of piping from the nozzle to the 90 LR elbow.

Pick [Valve] from the "ANNOTATION" — "Dimension" menu (refer to Figure 12):

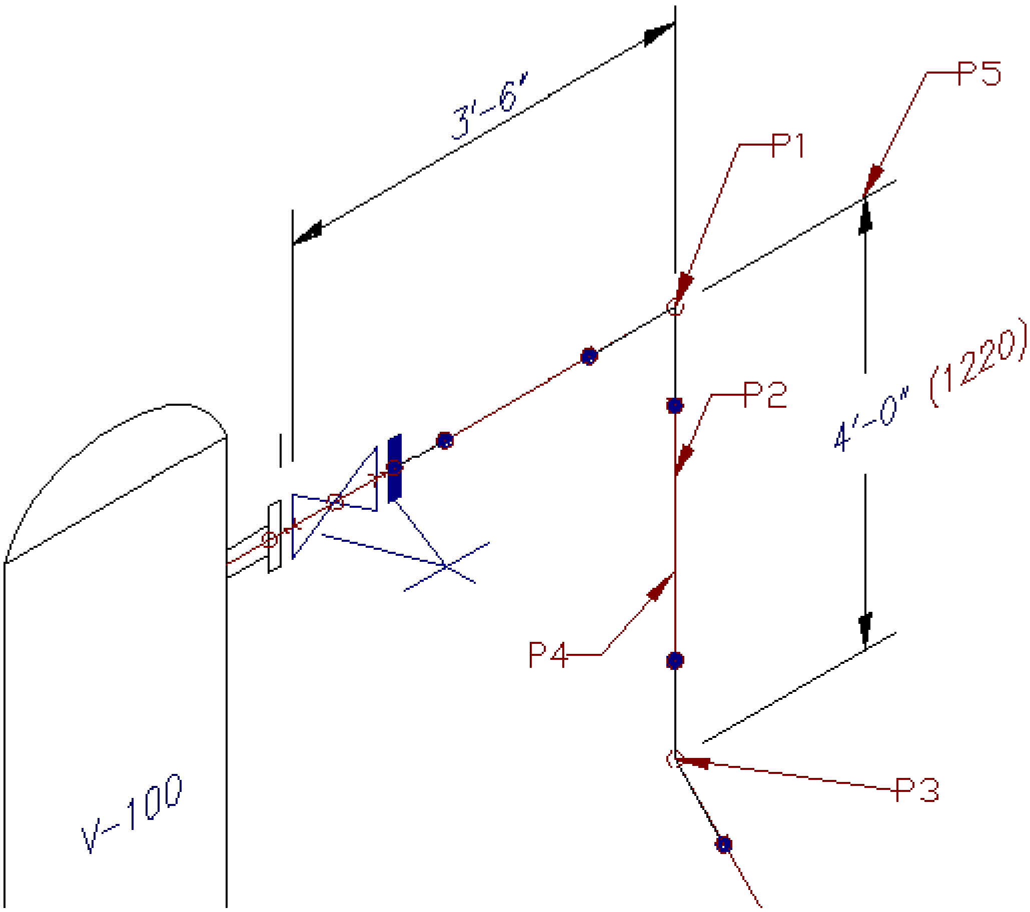



```
Command: <<Place dimension>>
Digitize 1st extension line origin: NODE of ... gasket found <P1>
                                    (Pick the gasket at the face of the valve, P1.)
Digitize 2nd extension line origin:NODE of..no gasket found <P2>
                                    (Pick the intersection of the elbow, P2.)
Digitize routing line segment: NEAREST to <P3>
Digitize dimension line location: <P4>
Enter dimension: 3'6 <Return> (1067)
Command:     (The command automatically checks the valve orientation and draws the
             dimension line in the correct isoplane.)
```

Dimension 90 LR elbow to 45 LR elbow

Next, we will dimension the vertical segment from the 90 LR elbow to the first 45 LR elbow.

Pick [ISO] from the “ANNOTATION” — “Dimension” menu (refer to Figure 13):



Command: <<Iso Dimensioning>>
1st extension line origin/Fitting to fitting/Real world/Edit/Auto/
Undo <Exit>:: NODE of **<P1>** (Pick the intersection of the 90 LR elbow,
P1.)

Digitize routing line segment: NEAREST to **<P2>**
2nd extension line origin: NODE of **<P3>**
(Pick the intersection of the 45 LR elbow, P3.)
Digitize routing line segment: NEAREST to **<P4>**
Dimension line location:: **<P5>**
Sum dimensions/<Enter dimension>: **4’<Return>**(1220)
1st extension line origin/Fitting to fitting/Real world/
Edit/Auto/Undo <Exit>:: NODE of **<Return>**
Command:

Dimension 45 LR elbow to 45 LR elbow

Next, dimension the segment between the 45 LR elbows using the Offset command.

Pick [Offset] from the "ANNOTATION" — "Dimension" menu (refer to Figure 14):

```
Command: <<Dimension single offset>>
```

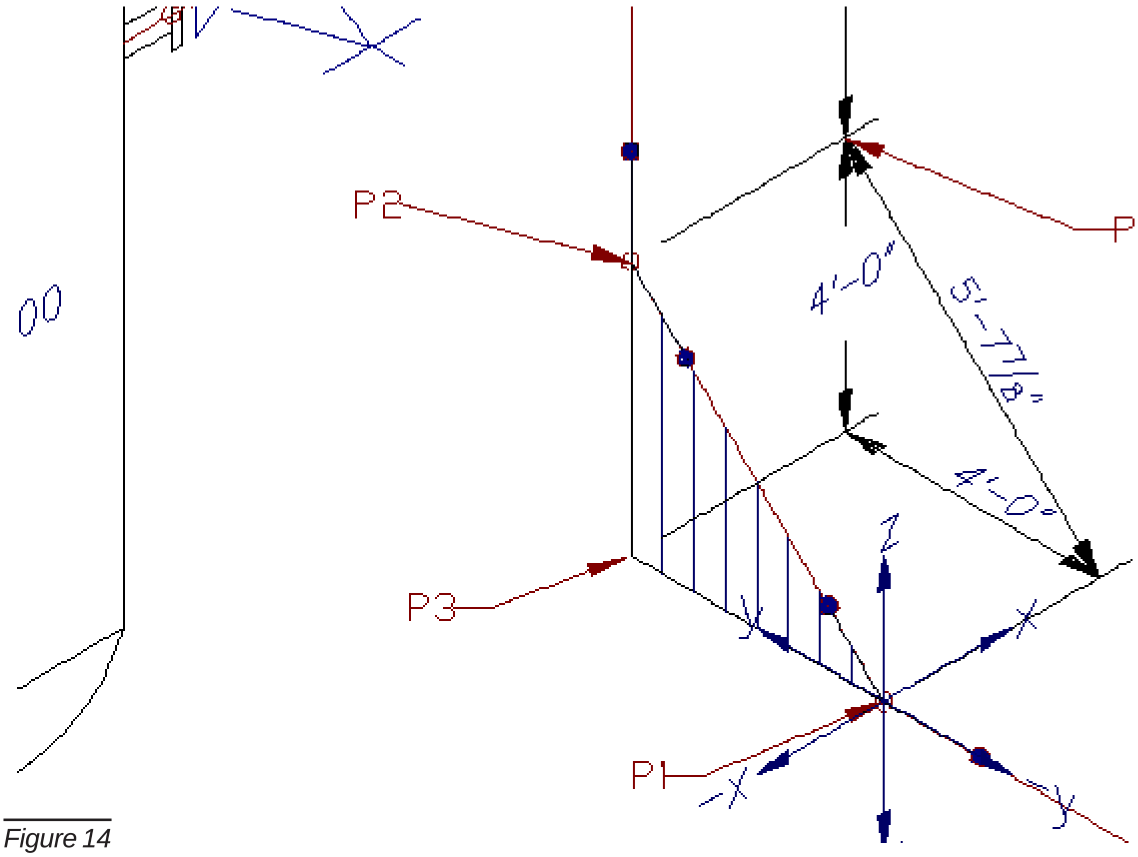


Figure 14

`Digitize start point/Edit <Exit>:: _node of` **`<P1>`**

(Use OSNAP NODE to pick the intersection of the second 45 LR elbow, P1.)

`Digitize end point:: _nod of` **`<P2>`**

(Use OSNAP NODE to pick the intersection of the other 45 LR elbow, P2. A coordinate system icon appears at the point of your first pick. This helps you with the following prompts.)

`Digitize corner::` **`<P3>`**

`Use real world points [No/Yes] <No>:`**`<Return>`**

`Enter delta y:` **`4'<Return>`** `(1220)`

(Enter the distance between P1 and P3 or delta y.)

`Enter Delta Z, or +/-%(S)lope, or +/-(A)ngle <Z>:`**`<Return>`**

`Enter delta z:` **`4'<Return>`** `(1220)`

(Enter the distance between the y axis and P2 or delta z.)

`Dimension line location:` **`<P4>`** (UseOSNAP Node to pick the tip of the previous arrow.)

`Digitize start point/Edit <Exit>::`**`<Return>`**

`Command:`

Dimension from 45 LR elbow to the blind flange

Dimension from the 45 LR elbow to the back of the blind flange.

Pick [Iso] from the "ANNOTATION" — "Dimension" menu (refer to Figure 15):

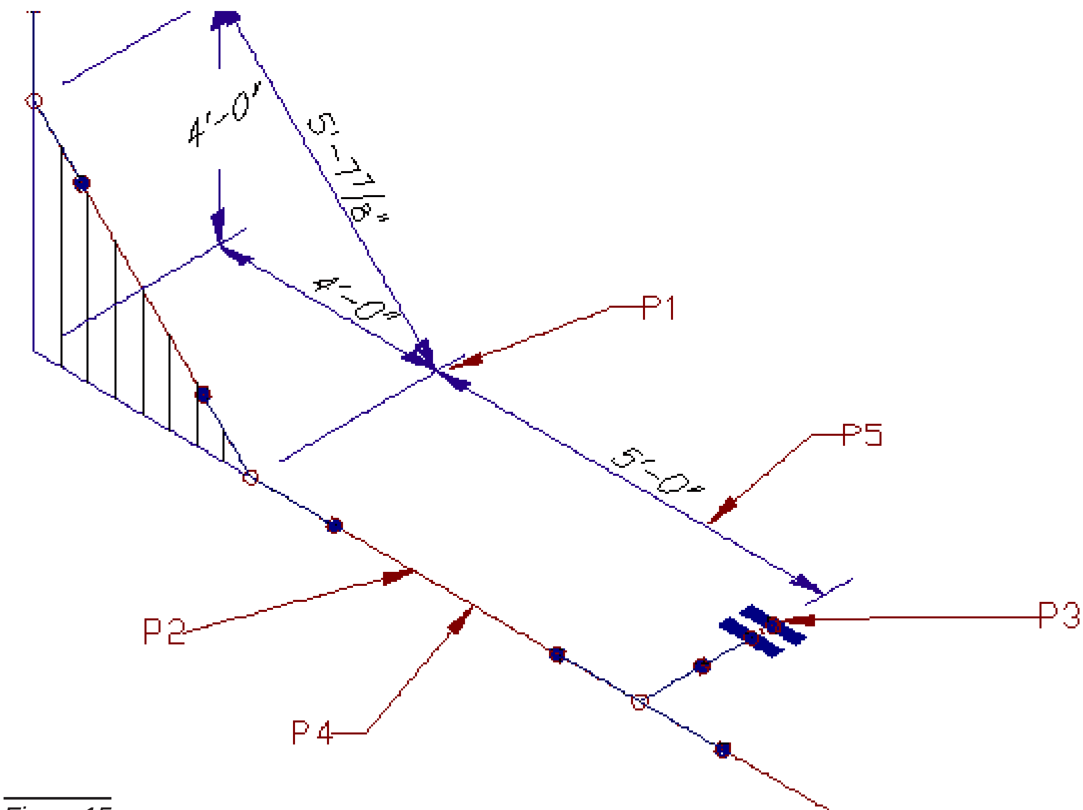


Figure 15

```
Command: <<Iso Dimensioning>>
1st extension line origin/Fitting to fitting/Real world/Edit/
Auto/Undo <Exit>:: NODE of <P1>
```
(Pick the point at the tip of the arrow for the previous dimen sion at P1.)

```
Digitize routing line segment: NEAREST to <P2>
2nd extension line origin: NODE of <P3>
```
(Pick the weld dot at the butt end of the blindflange, P3.)

```
Digitize routing line segment: NEAREST to <P4>
Dimension line location:: <P5>
Sum dimensions/<Enter dimension>: 5'<Return>(1524)
1st extension line origin/Fitting to fitting/Real world/Edit/
Auto/Undo <Exit>:: NODE of <Return>
Command:
```

Dimension from the blind flange to the face of the flange

Dimension from the blind flange to the face of the flange located at the end of the main run using the Valve Dimension command.

Pick [Valve] from the "ANNOTATION" — "Dimension" menu (refer to Figure 16):

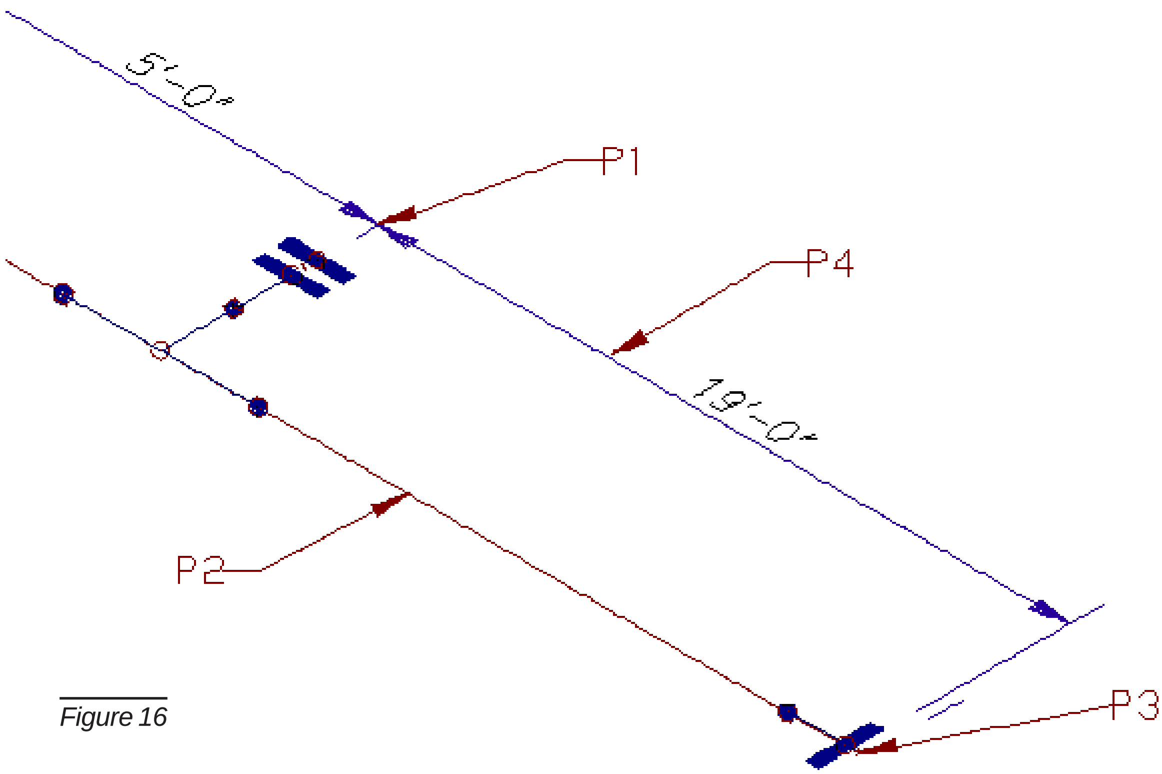


Figure 16

```
Command: <<Place dimension>>
Digitize 1st extension line origin: NODE of...no gasket found <P1>
                                    (Pick the point at the tip of the arrow for the
                                    previous dimension at P1.)
Digitize routing line segment: NEAREST to <P2>
Digitize 2nd extension line origin: NODE of ... gasket found <P3>
                                    (Pick the node (gasket) at the face of the
                                    flange, P3.)
Digitize dimension line location: / <P4>
Enter dimension: 19' <Return> (5791)
Command:
```

Place Pipe

Now that all the fittings and valves have been placed on the drawing and your drawing is fully dimensioned you can place the pipe on the routing line.

Pipe is placed after you have dimensioned the drawing so that CADPIPE can make use of the dimension information to calculate your true pipe cut lengths.

Pick [Pipe] from the "AUTO" menu:

```
<<Auto-PIPE>> <Sch STD>
Digitize routing line: Nearest to  (Pick any point on the routing line TUTOR3-
                                      ABB1.)
Placing pipe on Line Designation:<TUTOR3 -ABB1>
Command:
```

Place the Bill of Materials on the Drawing

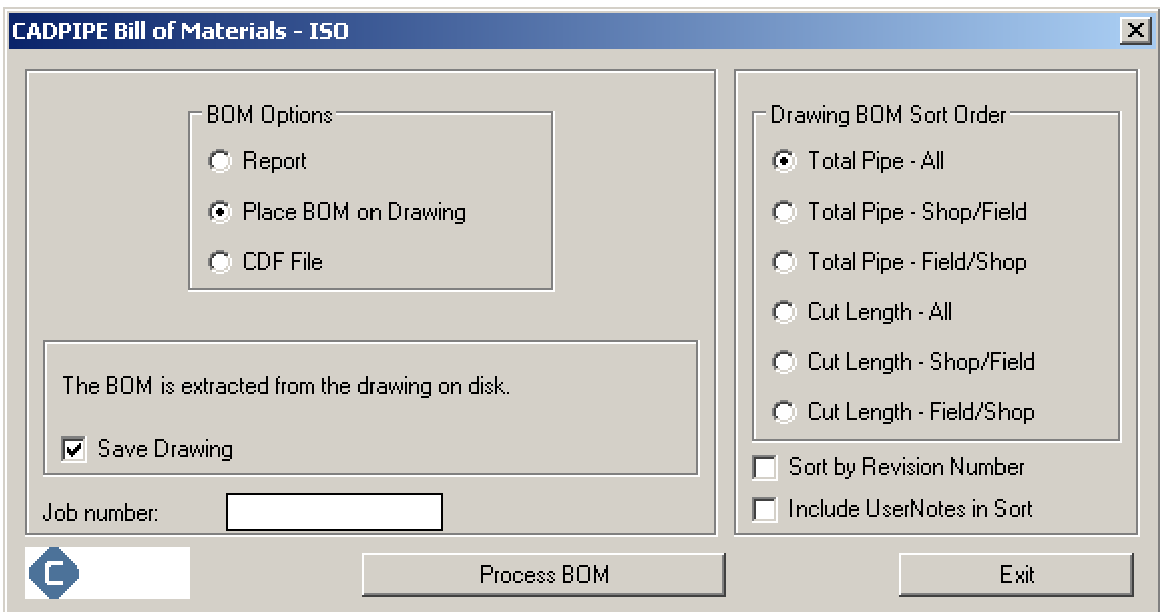
Next generate a bill of materials and place it on the drawing.

Pick [BOM] from the "AUTO" menu:

`Command: <<B O M>>`
`Enter job number:`**`<Return>`** (We have no job number, so press <Return>.)

The Bill of Materials dialog box appears. The CADPIPE Bill of Materials dialog box offers many different options for placing and sorting a BOM report. For more detail on the different options please consult the CADPIPE ISO Manual.

Select "Place BOM on Drawing" in the from the BOM Options, and click the "Process BOM" button (see figure 17).



The bill of materials listing is automatically inserted in the bill of materials area on the prototype drawing.

After the BOM is finished processing, the BOM dialog box will reappear. Click "Exit."

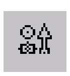
BILL OF MATERIAL

ITEM	QUANTITY	SIZE	CODE	RATING	DESCRIPTION
1	1	6"		Sch STD	90 LR Ell BW ASTM A234 WP11 23.50 lbs
2	2	6"		Sch STD	45 LR Ell BW ASTM A234 WP11 23.60 lbs
3	1			Sch STD	6"x6"x3" Red Tee BW ASTM A234 WP11 23.90 lbs
4	1	6"	VG302	300#	Gate Valve RF OS&Y,BB,Solid Wedge,ASTM A217 WC6
					13Cr.HF 320.00 lbs
5	1	3"		300#	RF WN Flange Sch STD bore ASTM A182 F11 11.00
					lbs
6	2	6"		300#	RF WN Flange Sch STD bore ASTM A182 F11 82.00
					lbs
7	1	3"		300#	RF Blind Flange ASTM A182 F11 16.00 lbs
8	1	3"		300#	1/16" Gasket RF Compressed Non-Asbestos
9	3	6"		300#	1/16" Gasket RF Compressed Non-Asbestos
310	5 7/8'	6"		Sch STD	Pipe Smls ASTM A335 P11 597.45 lbs
11	8	3/4"			Stud Bolt x 4 1/4" A193-B7 W/2 A194-2H Hvy Hex
					Nuts 7.78 lbs
12	36	3/4"			Stud Bolt x 4 3/4" A193-B7 W/2 A194-2H Hvy Hex
					Nuts 38.48 lbs
					Total Weight: 1143.72 lbs

Annotation

Place the North Arrow

Next, place the north arrow in the upper left-hand corner of the drawing.



Pick the north arrow icon from the "PLACE" — "Symbol" menu.

Toggle the ORTHO and Snap on so that the north arrow is placed in a valid isometric plane.

```
Command: <<Place north arrow>>
Digitize location and rotation angle: <P1> <P2> of Figure 18
```

(The insertion point is the center of the north arrow, P1. The rotation angle is entered by picking a point in the direction of the angle.)

```
Command:
```

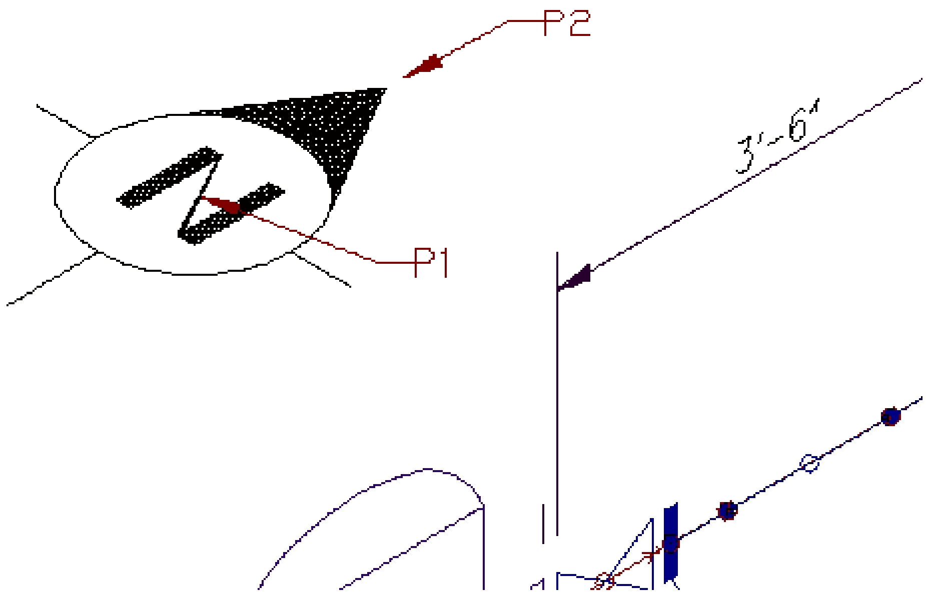


Figure 18

Label Lines

Place the line label for the TUTOR3-ABB1 and TUTOR4-ABB1.

Pick [Label Line] from the "ANNOTATION" menu (refer to Figure 19).

```
Command: <<Label Line>>
Digitize item <Exit>:: NODE of <P1>
```
(Pick the broken-circle attribute node on line TUTOR4, P1.)
```
Digitize tag location:: <P2>
```
(Pick the location of the first label. The insertion point is the center of the text.)
```
Digitize item <Exit>:: NODE of
```
(Change the isometric plane to top-left-hand.)
```
ISOplane <TLH>
Digitize item <Exit>:: NODE of <P3>
```
(Pick the broken-circle attribute node on line TUTOR3, P3.)
```
Digitize tag location:: <P4>
```
(Pick the location of the second label, P4. The insertion point is the center of the text.)
```
Digitize item <Exit>:: NODE of <Return>
Command:
```

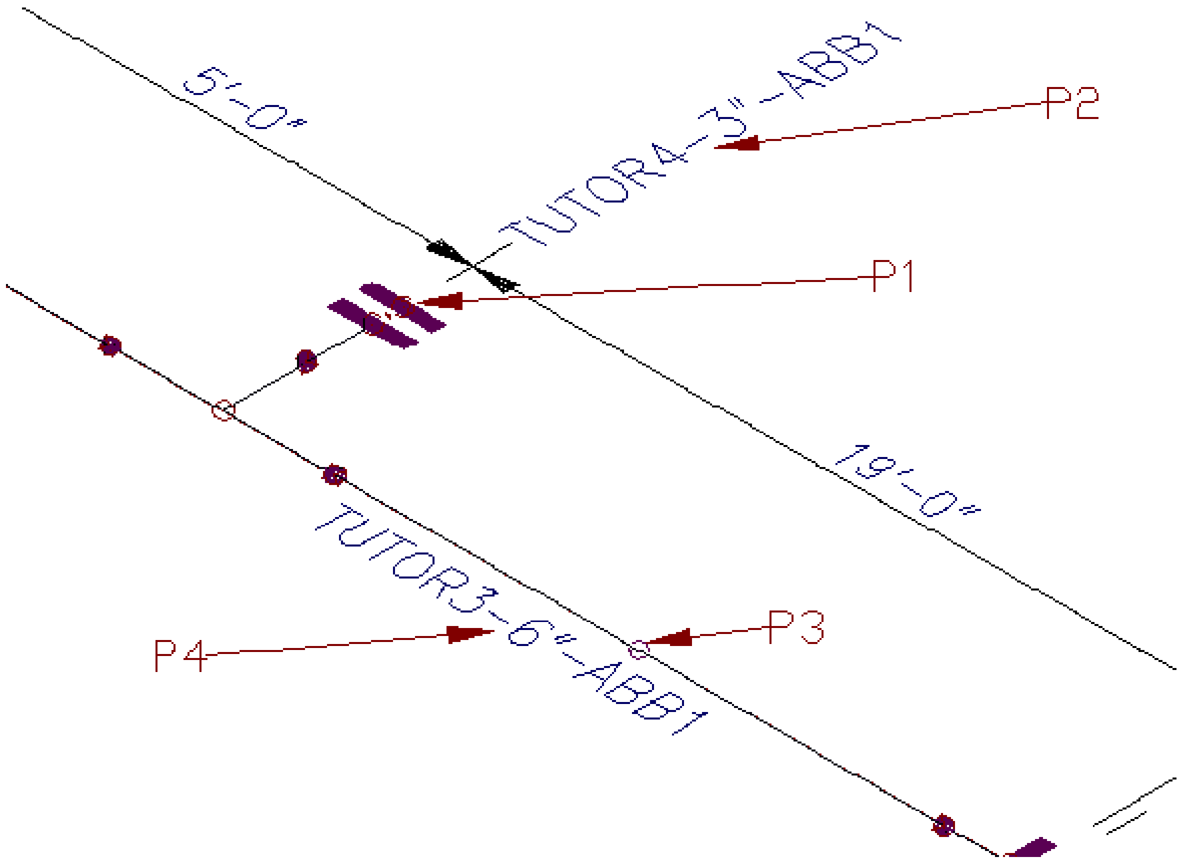
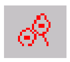


Figure 19

Balloon the Drawing

Now that the bill of materials is on the drawing, you can identify (balloon) each item with its corresponding number as it appears in the BOM.

You can place balloons automatically or manually. We will place our balloons automatically, and then rearrange the balloons with the AUTO-BALLOON editing features.



Pick the balloon icon from the "AUTO" — "Balloons" menu:

`Command: <<Place balloons>>`
`Auto/Insert/Edit/<Exit>::` **`A <Return>`** (Type **A** for "Auto").
`Working...`

(Refer to Figure 20. The balloons appear on your drawing with the numbers from the bill of materials. A number of the balloons overlap, so you need to do some editing. The balloons appear in the plane in which the corresponding fitting was originally placed.)

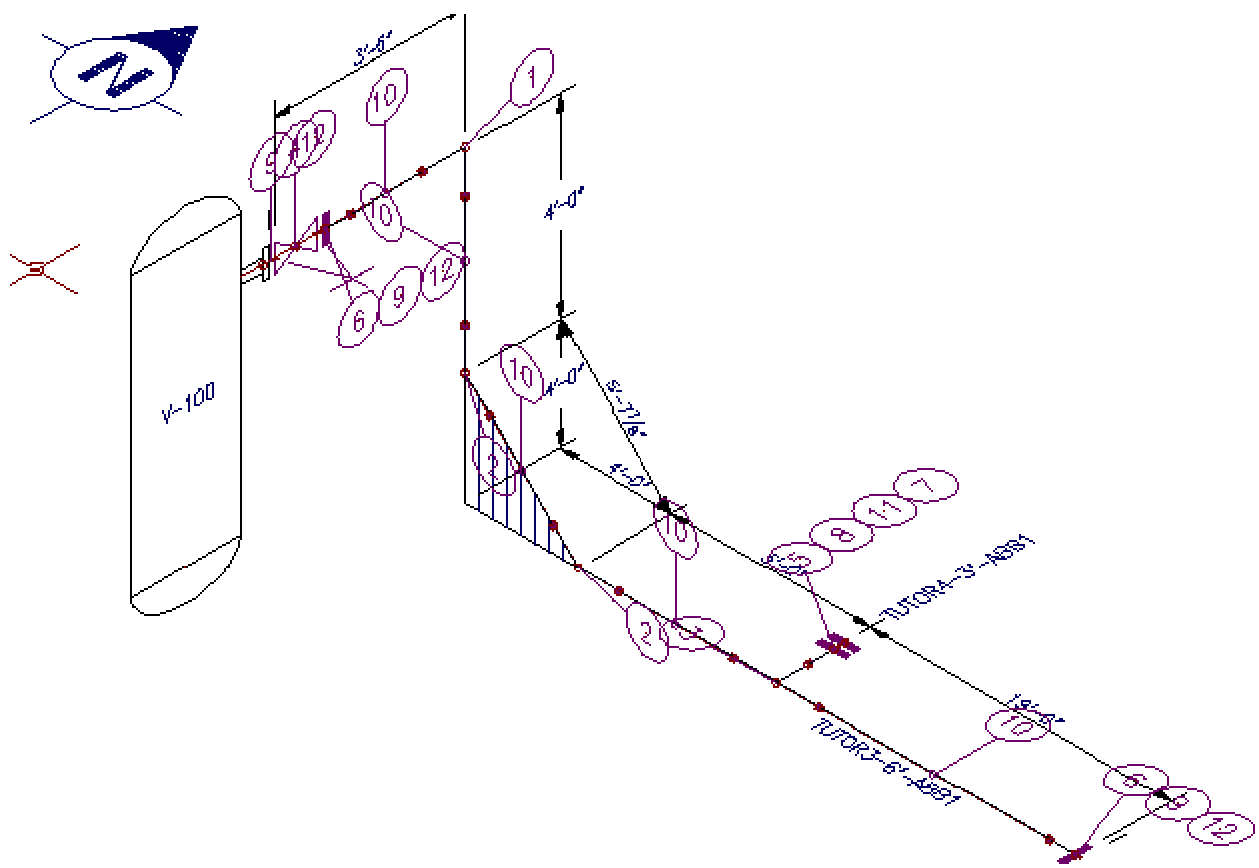


Figure 20

Zoom to the area shown in *Figure 21* to edit the first set of balloons:

`Auto/Insert/Edit/<Exit>::` **E <Return>**
(Type **E <Return>** to Edit the balloon placements.)

`Delete/Move/Leader/Plane/Group/Tidy/<Exit>:` **M <Return>**
(Enter **M** to use the Move option.)

`Select balloon <Exit>::` (Pick balloon 10.)

`working ...`

`Digitize new location:`**<P1>**(Pick <P1> for the new location.)

`Select balloon <Exit>:`
(Pick balloon 6. Balloons 6, 9 and 12 are considered a “Group” by the program. Balloon 6 is the “Lead” balloon of the Group. When you pick balloon 6 all three balloons are selected.)

`working ...`

`Digitize new location:` **<P2>** (Pick <P2> for the new location.)

`Select balloon <Exit>:` **<Return>**

`Delete/Move/Leader/Plane/Group/Tidy/<Exit>::` **P <Return>**
(Before we move balloons 5, 8, 11 and 7, we must change the plane. Type P to select the “Plane” option.)

`Select balloon <Exit>::`
(Before you pick the Lead balloon, change your current isoplane to Left Hand. Pick the isoplane from the “Isoplanes” toolbar or from the “ISOPLANES” menu that appears in the top menu bar. Do **not** select the isoplane from the “SET TINGS”—[Isoplane] menu; this command will cancel the Edit Balloon routine. Once your isoplane is set, pick balloon 5, the lead balloon.)

`Working ...`
(The balloons are placed in your current isoplane, left-hand.)

`Select balloon <Exit>::` **<Return>**

`Delete/Move/Leader/Plane/Group/Tidy/<Exit>::` **M <Return>**
(Now that the balloons are on the right plane, pick the Move option.)

`Select balloon <Exit>::` (Select balloon 5.)

`Working ...`

`Digitize new location:`**<P3>**(Pick <P3> for the new location.)

`Select balloon <Exit>::`**<Return>**

`Delete/Move/Leader/Plane/Group/Tidy/<Exit>::`**<Return>**

`Auto/Insert/Edit/<Exit>::`

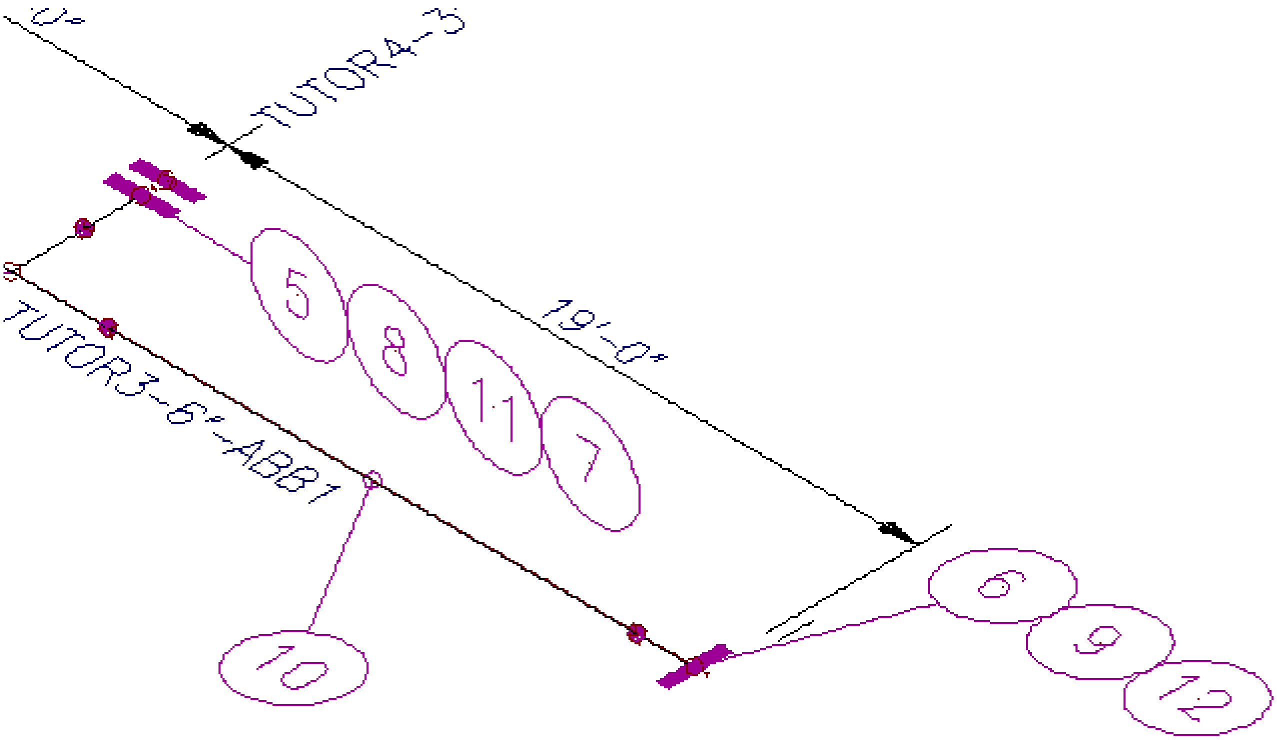


Figure 21

Continue editing the balloons so they look similar to the finished drawing found on page ISO-5 at the beginning of the Tutorial.

Congratulations, you have completed the CADPIPE ISO Tutorial! You may want to continue drawing with CADPIPE because there are many more features which have not been demonstrated through this Tutorial.

Feel free to experiment and consult the CADPIPE ISO Manual for further information.